INTERNATIONAL SOCIETY FOR THE STUDY OF TIME

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INTERDISCIPLINARY RESEARCH OPPORTUNITIES: LIMITS AND CONSTRAINTS

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The topic of limits and constraints offers a rich field of connected core questions in a wide range of scholarly, scientific, and practical fields. The phenomenon of emergence accompanied by qualitative global changes, noted with increasing urgency across many disciplines, has threatened alarmingly the core scientific concept of causality. The quantitative crossing of thresholds in which the limits and constraints of one regime give way to those of another has helped us rescue scientific and scholarly explanation from mere hand-waving. But it has also forced us to consider much more sophisticated conceptions of the nature of time—far beyond the naïve T axis of the usual graph or timeline—such as are offered by the International Society for the Study of Time.

In mathematics and physics one can cite the recent emergence of a whole field of math devoted, basically, to what math cannot do—a field including such elements as limit theory, unprovability, non-polynomially provable propositions, algorithms that take exponentially more time to solve the more variables, etc. There is a very interesting area between what can be proved or calculated and what can't, to describe the levels of difficulty of which mathematicians have had to resort to the metaphor of how much time it would take to solve. This, we may take it, is more than a metaphor. This problem is also a crucial issue in computer science—the calculation of a prediction of some real set of processes might be theoretically possible but would take more time than the event itself, even with a thermodynamically perfect computer. How fast a computer runs and how hot it gets seem at the limit to be absolutely connected. And anything can get too hot, to the extent that local energy minima, within which information can be stored, are catastrophically unstable.

In chemistry, one major issue involving the whole area of reactions, electron-sharing, and the dynamical structure of ordinary compounds now seems to be a scheduling problem, again involving limits. Roald Hoffman's Nobel-winning work illuminated this issue. Protein-folding, which according to Jeffrey Satinover involves the use by biological organisms of quantum computation to solve non-polynomially solvable problems in classical physics, is a good example of the issues here. On a larger scale the whole matter of phase changes, their speed, scaling, and microcosmic predictability, is closely bound up with constraints and limits.

In biology, one of the hot issues is apoptosis, or programmed cell death. Another is aging. For multicellular life to be possible, time limits must be set on the cell. For sexually

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TIME: LIMITS AND CONSTRAINTS

CALL FOR PAPERS FOR 2007 CONFERENCE ***INSIDE ON PAGE 2***

CALL FOR PAPERS

THE INTERNATIONAL SOCIETY FOR THE STUDY OF TIME

THIRTEENTH TRIENNIAL CONFERENCE
TIME: LIMITS AND CONSTRAINTS

Asilomar Conference Center, Monterey, California, USA
July 28 – August 3, 2007

The International Society for the Study of Time announces its thirteenth triennial conference, from July 28th to August 3rd 2007, on the theme of **Time: Limits and Constraints**. The ISST was founded by J.T. Fraser in 1966 as a scholarly society dedicated to the 'interdisciplinary study of time.' The ISST conferences create a unique environment of intellectual exchange by combining a highly productive conference theme with a location in a suitably memorable environment. Recent conferences include *Time and Uncertainty* (Castello de Gargonza, Tuscany, 2001) and *Time and Memory* (Clare College, Cambridge, UK, 2004). Selected papers from each conference are published in a series entitled *The Study of Time*, with *Time and Memory* (Volume XII) currently in press. The ISST also disseminates work through the associated publication *KronoScope: Journal for the Study of Time* (Brill Academic Publishers) and *Time's News*, the organization's newsletter for members. For further information: www.study-oftime.org

The 2007 conference will take place in an exclusive cluster of buildings in the Asilomar Conference Grounds, on the tip of California's Monterey Peninsula. Set in 107 acres of natural Monterey pines, graceful shores and meandering dunes beside the Pacific Ocean, in a region teeming with wild animal and plant life, Asilomar is an architectural sandwich: a showcase for the works of two major US architects from distinctively different periods in 20th century history. It has the largest single collection of Arts and Crafts style buildings, now designated a National Historic Landmark, completed between 1913 and 1928 by California's first licensed woman architect, Julia Morgan (who also designed Hearst Castle). Seven further complexes were designed and built in the style of that 1950s/60s by John Carl Warnecke, internationally known inter alia as the designer of the memorial for President John F. Kennedy.

CALL FOR PAPERS

The theme of the Society's thirteenth conference is **Time: Limits and Constraints**. Limits and constraints are rich terms that suggest many lines of conceptual and applied investigation into the study of time across all academic disciplines and fields of creative endeavor. These words have important technical or specific meanings in different contexts, as well as a range of interesting definitions and connotations in general usage. Though seemingly synonymous with limitation and constriction, limits and constraints also serve as boundary conditions that enable or induce change and novelty. Limits and constraints of temporal processes are as important and powerful for what they produce as what they prevent; they demarcate the parameters of emergence as much as endings.

The ISST encourages scholarship that interprets its conference themes in original ways. The open-ended subject-headings listed below are meant to provoke reflection and help generate stimulating proposals for papers, rather than to limit the approaches taken or constrain thinking minds. Proposals that address questions of time, constraints and limits from synthetic, interdisciplinary viewpoints will be given special consideration.

- Definitions and distinctions of limits and constraints in and across disciplines
- Temporal limits as limits of a world or umwelt

- Temporal constraints and the limits of the human or 'post-human'
- Constraints and creativity / limits and innovation
- Limits of temporal measurement and their implications
- History: limits and constraints
- Globalization mapped according to temporal limits and constraints
- The role of constraints in self-organization and emergence
- Narrative forms as temporal constraints
- Rhythm, refrain, restraint, constraints
- Temporal limits and freedom
- Ecological limits and the development of post-industrial society
- Biologically constrained evolution / technology's 'liberation' from constraints
- Evolutionary adaptation as a constraint on cultural evolution
- The limits of short-term desires versus long-term goals
- Stretching limits of human life through medical and technological advances
- Tragedy as accommodation of moral constraints and human limits
- Constraint-based writing and creativity
- Artistic schools and periods as constraints or limits
- Embedded systems of constraints and limits
- The limits of top-down vs. bottom-up temporal models

Presentation/paper proposals are called for from all fields of scholarly investigation and all forms of creative expression. Diverse formats welcome: scholarly paper, cross-disciplinary panel discussion, debate, performance/overview of creative work, installations, etc., workshop, poster. Panels may pre-circulate papers and feature discussion among participants. Each individual paper for a panel must be approved by the selection committee. All work will be presented in English, and should strike a balance between area of specialization and accessibility to a general intellectual audience.

Proposals should be approximately 300 words in length, and include the presenter's field of specialization and academic/professional affiliation. Proposals should be submitted electronically to ISST@StudyofTime.org, with the author's name as file name. Author's name(s) should not appear in the proposal, as the ISST does blind reviewing in selecting papers for its conferences.

The **deadline** for submission is **June 30th, 2006**.

Conference participants must be ISST members. For membership information and application procedures, visit our website (www.studyoftime.org). Membership includes subscriptions to the ISST circular *Time's News* and *KronoScope: Journal for the Study of Time*.

The Society also seeks session chairs, whose names will be included on the printed program.

ASILOMAR

Situated 105 miles South of San Francisco Airport, 310 miles North from LAX, and with its own local Monterey Peninsula Airport, Asilomar is within minutes of Monterey, Carmel and Pebble Beach, with local attractions including the legendary Cannery Row and Fisherman's Wharf. It offers the delights of the Monterey Bay Aquarium, many restaurants, and prodigious opportunities for walking, biking, swimming and golf. Even more than Castello de Gargonza and Cambridge, Asilomar is a wonderful place to bring children, for those who want to include the ISST conference in their family holiday plans. For adults it offers a privileged seaside retreat from the distractions of the day-to-day world, with all the pleasures of outdoor life including a Coastal Trail, sports facilities, barbecues and evening campfires, plus state-of-the-art conference facilities and full electronic connectivity for those who need it. It has a temperate maritime climate all year round. We believe it will prove a magical venue.

CALL FOR PAPERS

A MESSAGE FROM THE PRESIDENT:

TIMING LIMITS/WRITING HIJINKS

ISST is inviting minds: think timing, in its limits.
It's intrinsic, this strict limits thing, in timing's tickings, isn't it?
I think I'll mimic "limits" in imprinting this itty, bitty riff.

It's inspiring, if inhibiting, if in scribbling this strict script,
I'm inscribing it within rigid limits.
Disciplining signs in midnight writing is tiring.
Still, spiting critics' priggish smirks, I insist:
this striving isn't stifling—it isn't trifling; I'm thriving;
it isn't simplistic, it isn't nihilistic, it's giving distinct insights.
This limiting writing's gift is its implicit witticism!

Glib critics' sniping, dismissing ISST: isn't thinking timing's limits grim?
Is twilight's diminishing light sinking spirits in ISST's mind?
ISST's pitch: highlight timing's limits in physics—mini-string things!
Is it sci-fi?
Big limits in timing: infinity, divinity's trinity,
lightning striking in mighty milky night flights.

ISST's ink is spilling: divining missing links in timings' fifty kinds,
Sifting, distilling, listing, filing thrilling tidings in bright writs.

When the ISST Council enthusiastically selected "Time: Limits and Constraints" as the theme for our 2007 Triennial Conference, our one concern was that it might sound a bit gloomy in mood. But of course temporal finitude confers meaning on and gives shape to many processes. Human life gains its poignancy because it is shadowed by mortality; evolutionary jumps are induced by environmental limits.

It is widely believed that humans beings' awareness of death differentiates us from other species. I am not sure that I subscribe to this idea. But I do believe that our capacity to evolve and change our own culture is unique among terrestrial species. And this capacity is in turn driven, in part at least, by our ability to choose to impose constraints on ourselves. Electing to alter the parameters of our internal and external horizons is one of the most innovative ways humans have to incur innovations in their culture.

In other words, there is a strong link between constraints and creativity. Consider the humble, playful example of constraint-based writing. I treasure writing under constraints because I instantly transform into a linguistic hunter-gatherer—in reading any text at all (recipes or road signs, newspapers or novels), I am not only absorbing content but also searching for words. Writing under constraints makes writers and readers encounter language in new ways, and opens up different patterns of thought. In a sense, writing under constraints spurs a writer to break free from the constraints of habit formed by neurobiological and social development alike.

The fact that self-selected constraints can change behaviors shaped by evolutionary ('naturally-selected') constraints has wide-ranging implications. Choosing to impose selected constraints on our own social and cultural behaviors may in fact become a necessary component in human socio-cultural evolution. *In Time, Conflict, and Human Values* (U of Illinois P, 1999), J. T. Fraser sees humanity "in the middle of a new rite of time's passage," in which "the world will either collapse into a tribal chaos or evolve rapidly into a social system with sufficient inner controls to maintain a global present" (209). Humanity can only evolve toward a collective sensibility oriented by a "global present" by overcoming the so-called instincts of self-seeking and survival humans bring as part of our evolutionary baggage. The selfish economic mentality of consumer capitalism could be seen as a residue of the reptilian brain in us—our material choices and desires act in the immediate, impulsive range of the appetites and instincts of the limbic system. Values such as cooperation, coordination, and suppressing selfish desires in favor of a greater common good do not seem 'natural' in the popular (and largely misleading if not mistaken) image of humans in light of evolution. But we may need to impose these values on our choices and actions in order to take the next step in cultural evolution. Ethics and spirituality, two spheres where humans willingly hold their own wishes in check for some other purpose, may gain ascendancy in evolutionary usefulness. And who knows, idealism may even prove to be practical as a form of overcoming constraints and stretching our limits as a global species.

—Paul Harris

A WORD FROM THE EDITOR:

> For these [redwoods] are the last remaining members of a race that flourished over four continents as far back in geologic time as the Jurassic period. Fossils of these ancients have been found dating from the Cretaceous era while in the Eocene and Miocene they were spread over England and Europe and America. And then the glaciers moved down and wiped the Titans out beyond recovery. And only these few are left—a stunning memory of what the world was like once long ago. Can it be that we do not love to be reminded that we are very young and callow in a world that was old when we came into it? And could there be a strong resistance to the certainty that a living world will continue its stately way when we no longer inhabit it?
>
> —John Steinbeck, *Travels with Charley*

Between the towns of Morro Bay and Monterey extends a long, twisty, two-lane stretch of the Pacific Coast Highway. Squeezed between the Santa Lucia Mountain Range on one side and a deep drop to the Pacific Ocean on the other, it is the route taken by travelers who opt for a leisurely, scenic experience over the efficiency of the inland Highway 101. On fog-free days (alas, often rare during the summer months), you can see mile after mile of the coastline, jutting in and out with striking fractal self-similarity and fading eventually into the distance. But even during the foggy days, the sights are splendid. Less than an hour outside of Morro Bay is the Piedras Blancas Elephant Seal Colony where you can see these behemoths sunning on the sand, the males occasionally rearing up, roaring, and clashing with each other for territorial rights. The massive forms of the Pieadras Blancas ("white rocks") thrust out of the ocean in stark contrast to the expanse of blue water and blue sky. On the hills above looms the stunning Hearst's Castle, the "ranch" that newspaper magnate William Randolph Hearst had built when he and his cronies grew tired of "roughing it" in tents.

Farther up the coast, you come to the Big Sur region, a coastal wilderness renowned for its geologic and biological wonders. You can, for example, see McWay Falls, whose spray blends with the surrounding mist just as its waters blend with the ocean shallows into which they flow. Or you can scramble down a precarious foothold to a rocky ledge that juts into the Pacific, where rough waves slap against the rocks and the emerald-green waters of a protected cove ripple in sympathetic vibration. A cache of sea salt lies in a water-carved hollow, a crab scuttles into a crevasse, a geyser of spray spews from the mouth of a partially submerged cave. Or you can venture away from the ocean and along a forest trail, encountering the great redwoods of which Steinbeck wrote—those redwoods that remind us of both our newness and our ephemerality in the world.

Finally, you get to the Monterey Peninsula, the jagged rocks that rim it testimony to the ocean's power, its famed "Lone Cypress" a symbol of endurance. Amidst these natural splendors, time scholars from around the world will be gathering in the summer of 2007, ruminating on the nature of time as they observe the work of time in nature.

—Jo Alyson Parker

View of Monterey Bay with Monterey cypresses

Thanks to Saint Joseph's University for supporting this newsletter and to Saint Joseph's University Press for its production.

MEMBER NEWS

I encourage you to send me any time-related information and announcements, including your own recent publications or presentations on time-related themes. If you would like to have your news included in the next edition of the newsletter, please send a brief statement (no more than a paragraph) to Jo Alyson Parker at the following email address: jparker@sju.edu

HERVÉ BARREAU, Honorary Director of Research at Centre National de Recherche Scientifique, has had his book *Le Temps* published in a third edition (Presses Universitaires de France, 2005).

DANIEL CORRIE'S long poem "Death of a Theologian" appears in the summer 2005 issue of *The Southern Review*. The poem, ostensibly about the process theologian and accomplished ornithologist Charles Hartshorne, is a meditation on time, becoming, and nature.

ANNA AND HANNES EISLER, Professors of Psychology at Stockholm University, published the following article: Eisler, A. D., Eisler, H., & Montgomery, H. (2004). A Quantitative model for retrospective subjective duration. *NeuroQuantology*, 4. 263-291.

LAWRENCE FAGG, Research Professor in Nuclear Physics at The Catholic University of America, has published a review of *Time and Eternity: The Question of Time in Church, Science, and Theology* by Antje Jackelen (Templeton Foundation Press, Philadelphia, 2005) in the journal *Theology and Science*.

MICHAEL G. FLAHERTY, Professor of Sociology at Eckerd College, is a co-author of the article "Variation in the Perceived Passage of Time: A Cross-National Study" in the December 2005 issue of *Social Psychology Quarterly* 68:4 (2005): 400-410. His co-authors are Betina Freidin at Brandeis University and Ruth Sautu at the University of Buenos Aires.

J. J. A. MOOIJ, Professor Emeritus of Philosophy and Comparative Literature in the University of Groningen, has published *Time and Mind. The History of a Philosophical Problem*; translated from the Dutch by Peter Mason (Leiden-Boston: Brill Academic Publishers, 2005. xiii + 287 pp.). The book deals with a central problem in the philosophy of time: Is time dependent on mind or consciousness, and if so, in what respects? It analyzes the arguments (from ancient Greek philosophy until the present) and sets them in their historical context. Despite all the differences, the book shows important continuities as well.

IDA SABELIS, Professor at Vrije University in Amsterdam, calls our attention to the forthcoming conference "Retroscapes and Futurescapes: Temporal Tensions in Organizations," which will take place at Cala Rossa, Terrasini, Italy, from June 21-23, 2006. The link for the conference information is as follows:
http://www.google.com/search?q=cache:jnb74yK8XR0J:sceco.univ-aix.fr/ecoledoctorale/PalermoTimeConference2006-Call.pdf+retroscapes+and+futurescapes&hl=en&ie=UTF-8

GIOVANNI BRUNO VICARIO, Professor of General Psychology at Udine University, has published *Il Tempo: Saggio di psicologia sperimentale* (Time: an essay in experimental psychology) (Bologna: Società editrice il Mulino, 2005). He also published the book chapter "Temporal Displacement" in *The Nature of Time: Geometry, Physics and Perception*, ed. Rosolino Buccheri, Metod Saniga, and William Mark Stuckey (Dordrecht: Kluwer Academic Publishers, 2003) 53-66.

THOMAS WEISSERT, Executive Secretary of the ISST, is teaching an interdisciplinary course "Time" for a consortium of private schools in the Philadelphia area.

(*continued from front page*)

reproducing life, time limits must be set on the individual. This raises all sorts of fascinating questions—the absolute individual unselfishness of the cell's genes, the relative weight of programmed anti-oxidation precautions, the limits to the transport of trigger hormones and transmitters in embryology, the fraying of the telomere tags at chromosome ends, the immortality of cancer, the strange neuronal cell suicide that seems to happen in strokes, the connection between sex and death, group selection, and the distinction between multicelled organisms and communal organisms (is an ant's nest one organism or many?), etc. All of this is deeply relevant to time, both in the sense of a cell's allotted innings, and in the temporally existential implications for the consciousnesses that are carried by those cells.

In economics, the pricing mechanism, the "invisible hand," seems to be one emergent form of distributed nonlinear computation that evolved to solve the problem of the collation, measurement and dissemination of information about needs, an operation for which a single central calculator would not have enough time. The polycentric system of market pricing, requiring no more than the individual's knowledge of his own needs, can be seen as the solution to the limit problems of any local planning system that becomes overwhelmed by information and unable to cope with its inter-relations in real time. But of course with pricing, we run up against the moral problem—if it is a problem—of human historical events that are essentially out of control. The problem arises where the human intellect and deciding capacity must die, so to speak, in order for a collective mentality, however crude, to be born.

In the visual arts, the issue involves the constant battle between the drive to put huge amounts of information into a picture or sculpture or film, all of which must work together, versus the fact that the shape of anything is defined by where it definitively stops and something else begins. The Greek vase is a beautiful shape because, so to speak, of where it isn't. Around it is a lot of non-Greek-vase: limits again. Art, the Greeks knew, has to be tragic—that is, recognize to its horror that what it is, is meaningful precisely in terms of what it isn't, where it stops. What are the analogies between borders in space and endings in time?

In literature, the implications are obvious. Take, for instance, asking the simple evolutionary-psychological question: why do we enjoy tragedy? Isn't the whole postmodernist movement an attempt—unsuccessful, in my opinion—to find a different esthetic? The line ending is where the rhyme is. Literature needs the sense of an ending, in Frank Kermode's words. How does ISST's accumulated knowledge about time help us understand the sense of an ending?

In law, the issue could include the whole notion of sunset laws and the larger question of self-limiting constitutions like our own, which is ingeniously designed, like the dedicated cells of healthy organs, to not extend the writ of legislation indefinitely, to not invade the ungoverned "out-of-control" but self-policing realms of free civil society and the market. The laws of contract, tort, limited liability, trusts, etc., are all ingeniously designed limits to allow a sort of unlimitedness. In neuroscience we are finding out that the pruning of dendrites, the disabling of synaptic connections, and even the death of certain brain cells during embryonic development, adolescence, and maturation are the essential sculpting instruments of mentality. As I and others pointed out at Cambridge, perhaps the primary function of memory is to forget the inessential.

In theology one great battle is over the whole issue of the afterlife—to what extent are the limits of life permeable? Is the afterlife a huge theological mistake, or if not, what would it have to be like in order not to be banal? The other great battle is how much God would have had to limit himself in order for freedom to be possible—how much would he have had to make himself contingent upon history, in order to pass at least some of the causative agency over to the created universe—and what would "created" mean in these terms? How would the divine be distinguished from the collective computational process of the physical universe itself if much of its determinative power were delegated to its creation?

And in political philosophy—a relevant issue—s democracy, or at least true collective decision-making, essentially limited by national and local culture, or is at least some amount of it the precondition for national culture? Are we as humans by nature democratic (that is, able to recognize that our rights die where another's rights begin) or not? Can there be a natural law, both moral and political? And what is its status in relation to religious positive law? Can the latter even exist at all if it is coercive?

Some such set of questions might both have a common focus and appeal to a wide range of disciplinary interests.

INVITED ESSAYS:

THE INTERDISCIPLINARY QUESTION CONTINUED

Editor's Note: Time's News *36 (February 2005) included an invited essay by ISST Vice-President Nicholas Tresilian on the "interdisciplinary question"—a question that had been raised during the Cambridge conference and in a post-conference discussion among ISST Council-members. The essay sparked a lively discussion on the ISST list-serv among members, and I sent out a general invitation for brief essays on interdisciplinarity. Below are two essays and a postscript by Mr. Tresilian. The arguments presented do not represent an official ISST position on interdisciplinarity but are individual and varied responses that, it is hoped, will stimulate further thinking on this important subject. For more extended discussions of the interdisciplinary question, please see J. T. Fraser's "Space-Time in the Study of Time: an Exercise in Critical Interdisciplinarity" and Alex Argyros's "Out of Flatland: Deconstruction Revisited" In* KronoScope *5:2 (2005).*

INTERDISCIPLINARITY VERSUS MULTIDISCIPLLINARITY

TROY CAMPLIN,
RICHLAND COLLEGE, TEXAS

Is ISST interdisciplinary or multidisciplinary? What is the difference? Multidisciplinary people are literate in multiple disciplines. A common theme—such as Time—may thread the beads together, but ultimately there are language gulfs between the disciplines for multidisciplinary thinkers. At multidisciplinary conferences, people of different disciplines speak in their own languages to people in other disciplines. Even if "simpler language" is used, the groups are ultimately speaking different languages to each other.

Multidisciplinary thinkers are pluralist, non-hierarchical thinkers. Different disciplines are given equal weight, so that, for example, the theories of relativity and quantum physics are applied to human-level concerns. Multidisciplinary thinkers see no real difference between quantum-level and human-level concerns. The conclusions reached in the film *What the Bleep Do We Know*? are derived from this way of thinking, as are other claims that quantum physics tells us how things "really are." Their anti-hierarchical thinking makes them assume that all the rules of, say, quantum physics (the lowest level of hierarchical interdisciplinary thinkers) are equally applicable to biology and even human behavior. This way of thinking, though, is the necessary bridge between disciplinary and interdisciplinary thinking.

To be interdisciplinary, one must recognize the deep connection among the disciplines. Thus, a common language is developed that cuts through the disciplines—we develop a set of metaphors that lets us to speak about each level using the same concepts-words-metaphors. I tried to do just that in my dissertation, "Evolutionary Aesthetics," and I am working on doing it more explicitly in a work titled "Diaphysics," which investigates the ways everything in the universe is self-similar, regardless of scale or level. Also, ISST member Koen DePryck attempted to do this in his own book *Knowledge, Evolution, and Paradox: the Ontology of Language* (SUNY P, 1993). When we recognize the commonalities of each emergent level of reality, we will be able to talk about each of discipline using this common language.

An obvious set of metaphors for ISST members should be J. T. Fraser's umwelt theory of time, with its emergent levels. The way Fraser discusses time is interdisciplinary in the way I have outlined. But this is not the only reason Fraser's theory of time should be adopted. Similar ideas are being developed—with an apparent ignorance of Fraser's work—that support the idea of emergent, hierarchical levels of reality, including those of chemist Ilya Prigogine, Nobel Prize-winning physicist Robert Laughlin in *A Different Universe* (Basic Books, 2005), and the social scientists Ken Wilbur (*A Theory of Everything* [Shambhala, 2001]) and Don Beck (*Spiral Dynamics* [Blackwell, 1996]).

Wilbur's and Beck's interdisciplinary theory of human development is emergent and hierarchical in the same way as Fraser's theory of time. If the universe is indeed self-similar regardless of scale, this provides mutual support for each theory since it appears that human development mirrors the development of the universe as a whole. Their theory also explains why some may be more capable of true interdisciplinary thought—including whether people can be receptive to ideas such as Fraser's—because one must be a fairly complex thinker in order to accept emergent, evolutionary, hierarchical theories at all. The ISST is unique in that it probably has one of the highest percentages of interdisciplinary thinkers.

Let me suggest a few metaphors that might help us think in more interdisciplinary ways—metaphors that,

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not surprisingly nor coincidentally, are deeply connected to time.

1) Information. That which is without form yet gives form. Information is what allows complex, dynamic systems to form, allowing each element to communicate with other elements and, thus, coordinate their actions and co-operate. I propose adopting an ontology of information if we are to understand the nature of each emergent level of reality.

2) Fractal geometry. Recognizing that most things in the universe have fractal geometry and are thus self-similar has also helped me recognize relationships among such disparate things as quantum strings, DNA, and grammar. And it helped me recognize the resemblance between Wilbur's and Beck's ideas and Fraser's. This is an example of general pattern recognition; seeing self-similar patterns between two apparently different things at different levels of reality can help us to understand both things at both levels.

3) Emergence. The theory of emergence allows us to understand how new forms of organization, with new rules, can form from less complex parts. It shows us how quantum physics, chemistry, biology, human intelligence, and art and literature are connected, and how each level of complexity can arise. All the work on emergence parallels Fraser's umwelt theory of time and only seems to strengthen his ideas.

4) Paradox. Complexity arises when the universe attempts to resolve paradox—which only creates more paradoxes. The simultaneous retaining while resolving paradoxes (which is itself a paradox) is how we get emergence into new levels of complexity—which contain their own paradoxes. Information is a paradox—it is in form and yet gives form. It is important to remember that a paradox is not a contradiction. It is not impossible for both to be true—both are true.

These are only a few things we need to consider in learning to think in an interdisciplinary fashion, but they should be able to get us on the right track. If we want to be a truly interdisciplinary society, we need to be able to think through all the different levels and understand how they are all deeply connected.

INTERDISCIPLINARITY AND THE ISST

STEVE OSTOVICH,
PROFESSOR OF PHILOSOPHY
COLLEGE OF ST. SCHOLASTICA,
DULUTH, MINNESOTA

Let me begin by thanking Nicholas Tresilian for generating an important discussion of interdisciplinarity in the context of the ISST. I share his concern that "academic disciplines continue to de-couple themselves from each other and from the wider world" while "the wider world itself, brazenly indifferent to the rigours of academic discipline, is becoming ever more densely coupled up."

At the same time I am worried by some aspects of the ensuing discussion. It is almost as if we are responding to the lack of interdisciplinary communication by trying to develop another discipline, this one called something like "Interdisciplinary Studies." We look for a governing paradigm or a set of disciplinary rules of discourse in, for example, philosophy of science or J. T. Fraser's view of time's hierarchies. We organize our work around some goal that is best accomplished by collaboration across boundaries. In North America, at least, we set up university departments and chairs of interdisciplinary studies and establish professional societies for this work. This is, after all, how we in the academy have been socialized. More importantly, this is how we get funded! In many ways this work is good and appropriate. But it is also attended by a certain irony—in the interest of crossing disciplinary boundaries, we set up another discipline.

Something more is needed. This "something more" might be characterized as "soft" interdisciplinarity alongside (not instead of) the "hard" interdisciplinarity described above. The difference can be expressed metaphorically: hard interdisciplinarity seeks to set up a new space (and perhaps a new language) in which to carry on interdisciplinary dialogue; soft interdisciplinarity is literally utopian—that is, no place and every place, not a proper space at all but between spaces, where scholars speak from their disciplines but listen across boundaries (and where translation is the task, not developing a new language). It is this soft interdisciplinarity that I experienced at Cambridge where we spoke and listened as philosophers, as musicologists, as art historians, as social scientists, etc. So, too, Tresilian remains an art historian even as he describes the effect of interdisciplinary dialogue on his own work in terms of open/closed evolution and memes.

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J. T. Fraser's work has great heuristic power. It fosters the interdisciplinary character of the ISST's study of time as it inspires others to the same kind of meta-theoretical discourse that crosses disciplinary and social boundaries.

THE INTERDISCIPLINARY QUESTION: A POSTSCRIPT

NICHOLAS TRESILIAN
VICE-PRESIDENT, ISST

In one sense last year's interdisciplinary debate on the ISST website came to term with Gus Koehler's firm assertion that it was not possible to present an interdisciplinary argument without deep familiarity with each of the disciplines involved. Interdisciplinary studies, in so many words, have to be multidisciplinary as well. A not dissimilar argument had been advanced by a distinguished former President of ISST, Helga Nowotny and others in Michael Gibbons et al.'s *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies* (Sage: London, 1994), addressing "a new paradigm of knowledge production ('Mode 2') which was socially distributed, application-oriented, transdisciplinary and subject to multiple accountabilities." But in later years the Mode 2 bandwagon, in its purely academic manifestation at least, seems to have stalled on those very problems of accountability—the difficulty, in effect, of peer-reviewing the interactions between the disciplines and validating their contribution to the whole.

I have since wondered if the top-down approach to interdisciplinarity is altogether realistic—indeed if it is not another of those rather dangerous idealisations that have so often cluttered the progress of Western thought. The idea that to be an interdisciplinary player one must first be a master of all the disciplines relevant to the case not only calls for the existence of an elite whose skills absolutely transcend the conventional specialisation of an academic career, but also risks the creation of Frankenstein projects whose complexity is exponentially related to the number of the disciplines involved and forever beyond understanding. This has led me to wonder whether the Mode 2 cart of interdisciplinary speculation is not being erroneously put ahead of the Mode 1 horse of deterministic science rather than finding its proper place behind it. Or in other words, shouldn't we be looking at interdisciplinary thought as *preceding* the application of specialist disciplines, rather than as a separate level of understanding placed *on top* of the specialisations? In this diachronic rather than synchronic model of the cooperation of the disciplines, interdisciplinary thought would be recognised as a kind of ur-science, a way of turning up new *potentials* for science itself to test pragmatically and either consolidate, modify or reject according to specialist experience. I suggest that J. T. Fraser's *stable integrative levels of time* can be viewed in exactly this way, as a way of looking at the word that discloses new fields of creative possibility for both sciences and arts, and which is validated, ultimately, not by Fraser's beautifully persuasive prose, but by its fertility in the minds and lives of other creative people. (I am aware of my own work in the narrower field of art history and cultural evolution as likewise offering perspectives which only those more specialist than myself can finally validate or not).

The *a priori* nature of interdisciplinary thought, as I depict it here, should not in any way be seen as an abrogation of the multidisciplinary *grand projet*. But it does disburden the *grand projet* of the *angst* of an over-arching academic assessment which can never realistically be obtained. It also highlights the need for general management skills in multi-disciplinary projects. A general manager—be he/she the CEO of a company, the captain of a ship, the leader of a project in so-called "big science"—does not, indeed cannot, aspire minutely to understand every discipline involved in its conduct. But it is that individual's job to understand the potential represented by the coming together of those disciplines in that particular way, and to procure the conditions in which the disciplines can flourish and the potential of the enterprise be delivered as some form of added value, be it in manufactured goods, secure transportation from A to B, or the production of authoritative judgment leading to new science, new law or new economic action.

In summary, the relationship between interdisciplinary and specialist thought needs to be seen not as a matter of hierarchy, but as a sequence of feedback loops, in which each successively fertilises the other: interdisciplinary *ur-science* stimulating new specialist science, new specialist science in turn stimulating fresh interdisciplinary *ur-science*, in a virtuously iterative cycle. It is with such expectations, I suggest, that members of ISST convene for their triennial Conferences, the next of which is announced elsewhere in these pages. Meanwhile, perhaps what we really need now is the development of a new professional qualification, the science-wise equivalent of the MBA. It would be called the M.Sc.A—*Master of Scientific Administration*. If the M.Sc.A ever comes, please remember you heard it first suggested here in *Time's News*, message-board of a society established more than 40 years ago for the *interdisciplinary* study of time.

IMPORTANT REMINDERS

- Renewal of membership and dues forms for the year 2006 have been sent. Please note that in order to receive copies of *KronoScope* and "Time's News," it is imperative for all members to pay dues on time. These publications will be sent only to those members who have done so.
- You can submit your membership application and pay your dues online at http://www.StudyofTime.org. Please check the site for updated information on the ISST.
- Please request that your institution's library subscribe to *KronoScope*.
- If you have suggestions for agenda items for the next ISST Council meeting (to be held in September 2006), please contact Executive Secretary Dr. Thomas Weissert at ISST@StudyofTime.org
- Membership in ISST also gives you access to the ISST listserv. If you do not yet have access to the ISST listserv and would like to be added, please send an email message to that effect to the Executive Secretary.
- And, finally, the newsletter is intended not only to inform members about ISST business but to encourage your active involvement in the Society. If you would like to comment upon some of the items presented here (consider, especially, the discussion of the ISST's future in the Council minutes), please start a discussion on the listserv.

TIMELINE

The International Society for the Study of Time (ISST) is pleased to announce the inauguration of an Internet bibliography—TIMELINE—focusing on time-related scholarly publications.

Initially based on the edited volume Dr. Samuel L. Macey's *Time: A Bibliographic Guide* (1990), with more than 6000 citations, this electronic resource is the 25-year vision of the founder of the ISST, Dr. J. T. Fraser. Dr. John Cordes coordinated efforts to put "Timeline" online, and Mr. Philip Gollucci did the necessary programming.

This open-ended electronic bibliography is a work-in-progress. Over time we hope to keep increasing the number of citations as well as extending and refining its system of classifications utilizing recent scholarly works many of which we hope that you recommend to us.

To access this bibliography, go to the ISST website at www.studyoftime.org and click on the "Timeline" link. This link will direct you to the bibliography's site. On your first visit there you will be asked for registration information. That information will be sent to the Timeline Coordinator and member of the ISST Council. Within 24 hours a unique login id and password will be emailed to you for access to the site. The site is free and open to all scholars in all fields.

We hope that you find this work and the work of the ISST to be of very useful interest.

FOCUS ON THE 2007 CONFERENCE

Greetings, Time Scholars,

Once again we've reached that point in our three-year cycle where we ask you to begin planning for the next triennial conference. As you see from the call for papers included in this issue, we expect that the theme and the location for the next meeting will generate both excellent scholarly work and an enriching interchange of ideas.

I for one am very excited about this particular topic. Over the years, the layering of my grasp of the subtleties of the term "constraint" has been emblematic of my passage from layman to physicist and physicist to writer. In its everyday usage, the term connotes the negative; it is a restriction, a preventing, a holding back, an inhibition. But in physics, constraints make solutions possible; they enable. The selection and description of constraints is an art form. The genius of an elegant solution to a physical problem lies in the judicious choice of constraints. Indeed, the language of constraints in mechanics is quite an elaborate and sometimes arcane affair. According to Herbert Goldstein, "Imposing constraints on the system is simply another method of stating that there are forces present in the problem that cannot be specified directly but are known rather in terms of their effect on the motion of the system" (*Classical Mechanics* [1950; Reading, MA: Addision Wesley, 1980] 2/e, 13; my emphasis). The method of constraints as a generative process has been detached from the physics and turned on the creative process of writing itself. As Paul Harris describes in volume nine of *The Study of Time*:

> Oulipian writers impose constraint that must be satisfied to complete a text, constraints ranging across all levels of composition, from elements of plot or structure down to rules regarding letters. […] Constraints serve two functions: they create a syntactic frame, thereby marking off the "potential" play-space of the artistic production, and then inscribe the generative code of a text into its very texture." ("Scaling Mortality to the Letter: Georges Perec's Stylistic Mechanics of Death," *Time, Order, Chaos: The Study of Time* IX, ed. J.T. Fraser, Marlene P. Soulsby, Alexander J. Argyros [Madison, Connecticut: International Universities Press, Inc., 1998] 52-53)

Clearly, the subject of "Constraints and Limits" goes beyond physics or mathematics. It is tied in to our modes of discourse and discovery and thus must play a significant role in many disciplines and so in the interdisciplinary study of time.

As for the conference site, I have had the pleasure to visit the Asilomar Conference Center in Monterey, California, and the following is excerpted from my report to the Council: In my opinion, the site is nearly perfect for our needs. Sitting on the tip of the Monterey Peninsula and adjoining a public beach, Big Sur, and the famous 17-Mile Drive, the grounds are a beautiful example of northern California coastal environment. Beginning as a Girl Scout camp in 1913, Asilomar has grown to a mature conference facility with rich, original but gloriously restored architecture mixed with more modern facilities.

The converted chapel that would be our main conference room seats 150. It, as well as many of the original buildings, was designed by Julia Morgan, the architect who also designed Hearst Castle (which is two and one half hours away down the coast). The room is lovely and comfortable with theatre seating fixed on a pitched floor for excellent viewing. We will have exclusive use of this building for the week we are there. There are also secondary and more modern conference rooms with movable seating that we can use for parallel sessions.

The lodging rooms are spread over many small, independent lodges situated about the site. Each room has its own bathroom with shower or bath. The four "historic" lodges each have a common living room that would be excellent for informal evening gatherings.

All three meals are served "family style" in the large 850-seat common dining room. Each large round wooden dining table seats about 10 people with a lazy susan in the center of the table. While we cannot have this room to ourselves, a number of tables can be assigned to us in a group, as was the case in Saint Adele.

The public beach lies just off-site a very short walk away. Most of the site offers a view of the ocean. There is a Gargonza-like outdoor pool that is heated to a constant 78 degrees F, open dawn to dusk but unsupervised. The ocean water is cool but tolerable. Expect the air temperature to be 60-75 F at this time of year and foggy. There is also a

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NOTES FROM THE EXECUTIVE SECRETARY

(*continued from page 11*)

volleyball pit, oceanfront boardwalk and walking trail, and a social hall with billiards, ping-pong and grand piano (also free wireless internet access). There are bicycles for rent on site and access to the scenic 17-Mile Drive a block away is free to people on bikes.

The rooms do not have phones, televisions, or internet access. There is adequate parking on site. A bus service offers connections from the nearest airports: San Francisco (2 hours), San Jose (75 minutes), and Monterey (15 minutes). For activities, there are the nearby Monterey sites: Cannery Row (immortalized by writer John Steinbeck), Fisherman's Wharf, the Monterey Bay Aquarium, about six golf courses, and a gorgeous coastline. The city of Santa Cruz is also a short drive away. As we get three meals a day as a non-negotiable part of the package, on the free day, the lunch fare could be turned into box lunches for those who are leaving for the day. Breakfast and dinner would be served as usual, as well as lunch for those who are on site.

In other news, between now and next September, among its other duties, the Council will be thinking about the officers and the make-up of the Council for the next three-year cycle. If you would like to be considered for any of the offices (president, vice-president, executive secretary, treasurer), or would like to put your name into the ring for the next Council election, to be held next winter, please contact me via email. As many of you know, the Society maintains a web site (http://www.studyoftime.org) that has both public and private sections for our use. We would like to expand that site to make it more of a resource for our community. As announced in this newsletter, we are excited to see the addition of TIMELINE, a searchable online bibliography of time-related publications. Also in the works is a better and more extensive list of links to other time-related web sites, and the reinstatement of an archive of information on past conferences. If you would like to see more improvements to the site and would like to volunteer your time to make those improvements happen, please contact me. Finally, I notice that many of your email accounts are bouncing the call for papers. Please check with your email system or IT people to ensure that mail from the listserv (ISST-L@lists.psu.edu) are allowed to reach you. Until next time, I look forward to receiving your submissions for the next triennial conference.

Your Executive Secretary,

Thomas Weissert
Weissert@StudyofTime.org

J.T. FRASER PRIZE

The Society is seeking the thoughts of its members as to what books or other works you believe to have made a significant contribution to the study of time. We are interested in books that may have been overlooked because they are focused on a particular discipline, as well as more general works that deal broadly with the subject of time. The Fraser Prize, as most of you know, is awarded by the Society at its triennial conference to books or other works that have made a significant contribution to the study of time. Our purpose in soliciting your thoughts, however, is twofold: both to find books or other works that are worthy of consideration for the Fraser Prize and to seek books that should be considered for review in *KronoScope*. Please send your suggestions to the ISST listserv or, if you prefer, to Mark Aultman, Chair of the Fraser Prize Committee, at Aultmanmh@cs.com or to Jo Alyson Parker, Book Review Editor for *KronoScope*, at jparker@sju.edu. If the work is such that its significance might not be understood by those outside a particular discipline, any thoughts as to why the work is of significance and why it should be reviewed will be especially appreciated.

MINUTES OF THE 2005 ISST COUNCIL MEETING

SEPTEMBER 17 AND 18, 2005
STRATHMERE, NEW JERSEY, USA

In attendance: *Mark Aultman, David Burrows, John Cordes, Michael Crawford, Robert Daniel, Koen DePryck, J. T. Fraser, Paul Harris, Jo Alyson Parker, Marlene Soulsby, Nicholas Tresilian, Frederick Turner, Thomas Weissert*

Dr. Harris convened the meeting at 9:37 AM, September 17.

REPORT ON TIME'S NEWS (DR. PARKER)

Saint Joseph's University will continue to support the newsletter. The column of time-related events has been moved to *Kronoscope* and the website. The Council discussed whether the newsletter's time has come and gone, and the general agreement was that a paper mailing still has more heft than email. The Council discussed the possibilities of having a PDF link on the website with members having the option to receive their copy via email. It was suggested that PDF copies of the newsletter be sent to lapsed members to remind them of the ISST.

REPORT ON THE STUDY OF TIME (DR. PARKER)

Dr. Parker met with Mr. Joed Elich of Brill Academic Publishers in Philadelphia in August, 2005, and they drew up a contract for the forthcoming volume. Thanks were given to Dr. Weissert for constructing a database for keeping track of submissions. In addition to the 19 essays, the volume will also include several brief responses by reviewers.

REPORT ON KRONOSCOPE (DR. SOULSBY)

Dr. Soulsby discussed the distinctions between *KronoScope* and *Time and Society*. Although both have articles and book reviews, *KronoScope* is different in that there is a diversity of types of pieces: news and views, essays, translations, reports on time conferences. The editor is looking for a balance of content. Dr. Fraser pointed out that *Time and Society* does not deal with the sciences generally whereas *KronoScope* does. Nick Kraaj at Brill has facilitated a smoother turn-around with regard to page-proofs. There is still a problem with timely distribution. The Council discussed means of promoting *KronoScope*, including soliciting articles from non-members as well as members, submitting targeted calls for papers to various listserv (for example, the Penn Listserv, SLSA, and science listservs), contacting authors of books that are reviewed, having Brill send samples of *KronoScope* to the article reviewers, having special themed issues that would attract specific authors' interests. It was also suggested that we contact and make connections with the Philosophy of Time Society and invite them to become more involved with the ISST.

REPORT ON TIMELINE (DR. CORDES)

Dr. Cordes gave an overview of the process of getting Timeline ready to go online. His graduate student was responsible for doing much of the work of compiling citations. The Council discussed how to promote the use of Timeline and control its growth. Recruitment of new ISST members is a vital piece of the project in that new users' email addresses may enable the ISST to compile a recruitment list. Dr. Harris suggested that there be a formal launch of Timeline at the 2007 conference, including recognition of Dr. Samuel Macey's contribution.

ADMISSIONS REPORT (DRS. WEISSERT AND CRAWFORD)

There have been five new members accepted into the society since Cambridge. Dr. Clausius (Admissions Chair) has suggested that, because the process of submitting a curriculum vitae may be offputting, we should simplify the requirements for admission in the Society, thus expanding the membership base. Mr. Tresilian suggested adding a blank on the membership form to allow a self-explanation of prospective members' qualifications, which could also serve as an introductory statement on the website. Dr. Daniel volunteered to write a new form that the Council could peruse. Dr. Crawford suggested putting a a link to *KronoScope* on the membership application form.

TREASURER'S REPORT (DR. DANIEL)

The Council discussed the report. Dr. Daniel suggested that the fiscal year be parallel with the calendar year, with an interim report being given at the Council meeting time. Returning members have requested back issues of *KronoScope*; they need to contact Brill. Brill would like to change the billing for *KronoScope* to be all in advance. In order for the ISST to do so, the contract with Brill would need to be renegotiated. Until that happens, the ISST will continue to pay after the journal's mailing. The ISST would need to see at least two successful mailings before negotiating to pay in advance.

LOCATION FOR 2007 CONFERENCE
(DRS. SOULSBY, WEISSERT, AND DEPRYCK)

The Council considered three sites: the Sterling Inn, Pennsylvania, USA (Soulsby); Antwerp, Belgium (DePryck); and Asilomar, Monterey Peninsula, California, USA (Weissert). After a discussion of amenities, accessibility, size, and costs, the Council selected the Asilomar site.

DISCUSSION OF THE THEME

Dr. Harris disseminated the response to the call for theme discussion from the membership. Various options were considered, and the Council opted to continue pondering the matter and vote on the theme the following day.

DISCUSSION OF THE FUTURE OF ISST

The Council discussed the question of what would we like the ISST to be in 5 and 10 years. Preliminary discussion topics included the following: how to counter the swell and shrink of membership that occurs during the three-year cycle between conferences, whether the ISST should hold interim conferences and how those might be structured. Dr. DePryck suggested that the Antwerp facilties host an interim conference in 2008/9. Council members agreed to come back to the question of the future of the ISST the next day.

The meeting was adjourned for the day at 5:20 PM.

Dr. Harris reconvened the meeting at 9:30 AM, September 18.

CONTINUED DICUSSSION OF CONFERENCE THEME

After much discussion, the majority voted for the theme "Time: Limits and Constraints"

CONTINUED DISCUSSION OF THE FUTURE OF ISST

Discussion topics included the following:

- a time lexicon;
- increasing membership from Asia, Africa, etc.;
- increasing membership yet not to the point where the close-knit quality of ISST is compromised;
- forging relationships with other time societies;
- the creation of a physical institute;
- bringing in young scholars and graduate students;
- encouraging different approaches to what time is;

ISST Council-members discuss plans for the 2007 conference.

- alternating conferences in the short term;
- getting more people involved in the conference process;
- working through the membership directory to get a better understanding of the categories of the membership makeup;
- engaging more proactively with society as a whole and helping people to develop a sense of what time is;
- expanding the public awareness of the society;
- developing "teamware" to create more collaboration of members over the internet;
- establishing the study of time as a discipline;
- subventions for graduate students and third-world members and money to support the various projects;
- involving more people from other disciplines besides academics;
- contacting other societies with a reciprocal offer to give the options to get newsletters and join and "advertise" their conferences on ISST website;
- becoming the central venue for the study of time;
- more support for seminar discussions of issues;
- targeting an academic institution to start up an interdisciplinary program in time studies;
- the need for critical interdiscipinarity;
- livening up the listserv.

The meeting was adjourned at 10:30 AM.

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